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Engineering Standards for Society

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Now and then breadth of thought and fluency of word find common expression in an engineer and make him well worth listening to. Such a combination is marked in the address of Dr. Smith, at the Annual Dinner of the American Institute of Mining and Metallurgical Engineers, on February 20, 1929. A few noteworthy excerpts are given here.

THE distinction between science and engineering is a difference both in purpose and in method. It is the sharp contrast between theory and practice; it marks the broad gap between dream and attainment. You remember the old saying that "where there is no vision the people perish"; translate this into modern experience and we may say that "where there is no science, the engineer fails".

There are, then, two torch-bearers in this never-ending relay race: one lights the torch of science in eternal truth and uses it to fire the imagination; the other carries the same torch still onward and uses it to kindle the fires of industry and commerce and to illuminate the pathway of human progress. It will be a sad day for mankind when either of these torch-bearers fail to do his part—when scientific research lags behind or engineering practice does not carry on.

As I view the new outlook of engineering I cannot subscribe to the century-old definitions which restrict to the resources of Nature the application of science by the engineer. In its subject-matter, engineering is more human than mechanical. Not only does engineering have human welfare at its very center, but in its expanding field it touches humanity at all points on its circumference.

Time is one of the counters by which the engineer measures success. He realizes that saving time is saving human energy, whether that energy is being currently expended as labor or has been stored up in what we call capital. Increasing the wattage of human energy without raising the voltage too high is the task which human engineering sets itself: in other words, making the workman more effective with fewer hours of work and under less rather than more pressure—that is true conservation of human energy.

It is a commonplace of the changing standards of living that the wage earner of our day can command lux-

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Advanced Studies

THE attention of graduating members of the Student Chapters is called to detailed announcements appearing in Items of Interest (Part 1) of this issue of Proceedings relative to post-graduate opportunities.

Six openings are listed, all in the nature of possibilities for advanced study—one at Columbia University, and five at the University of Wisconsin.

Not all graduates will wish, or perhaps can find it financially possible, to continue their intensive scholastic training. To those who are ambitious, however, here are chances which materially reduce the expenses.

The Dallas Meeting

PLEASANT surroundings, beautiful weather, and attractive social functions have been found to have as great an influence as the technical features on the impressions carried away from a meeting. This being true, the Spring Meeting at Dallas gives every promise of being a success. Sponsored by a Local Section composed of more than 400 active members, the Dallas Meeting will likely be long remembered by those fortunate enough to attend.

The Technical Sessions, devoted to the major problems of the region—Oil—Highways—Surveying and Mapping — Irrigation — and Sanitation will attract members from all parts of the vast region known as the great Southwest.

Drives, entertainments and social features will likewise be attractive for visiting ladies. With spring well on its way, the ladies will be able to appreciate the beauties of the city and surroundings through entertainments planned by the wives of the local members. A Mexican *fiesta*, arranged for their pleasure, might prove attractive to the men as well.

More especially appealing to them, perhaps, will be motion pictures of the many phases of the oil industry, and the opportunity to examine one of the largest power plants of the Southwest. A whole day is to be devoted to this project which will be reached by special train.

Dallas is one of the largest cities in this rapidly developing newer portion of the country. It is characteristic of its environment. To see it and to catch something of its spirit will be for the Northerner or the Easterner a new experience.

Members who yield to the attractions of this occasion and become guests of the Texas Local Section, April 24-26, will be well repaid.

Worthy of His Hire

At its meeting on January 17 last, the Board of Direction adopted the following resolution:

"WHEREAS, the engineering profession is mindful of the honor and privilege that is conferred on the profession, and its members, when given an opportunity to render service to the Federal Government; and

"WHEREAS, the records of the various Federal offices, through its various bureaus and departments, are replete with examples of such service by the engineering profession, efficiently and honorably rendered by engineers since the earliest days of the Republic; and

"WHEREAS, the Federal Government should be in a position to secure the highest grade of consulting service in the engineering, as in the case of the legal and medical professions, and on a par of professional employment with that of other governmental jurisdictions and of industry; when such advice is sought by the Federal officials through special request or Congressional enactment;

"THEREFORE BE IT RESOLVED, that the Board of Direction of the American Society of Civil Engineers requests that Congress by appropriate action provide that the appointment of consulting engineering service, either by executive action or Congressional enactment, may be made on a basis that will provide for adequate compensation, which should be a minimum per diem rate of $100 (One Hundred Dollars) and expenses in the performance of the prescribed work."

Mr. A. B. McDaniel, Member, resident in Washington, has been appointed by President Marston as the Society's representative to bring this matter to the attention of the proper authorities. It will be his endeavor to bring about such changes in legislation as are necessary to make this principle operative in instances connected with the Federal Government.

The matter arose at the suggestion of the Chairman of the Society's Special Committee on Charges and Methods of Making Charges, and, being brought to the attention of the Board, acquired this form. It now has official status, and the moment may come when the help of members at a distance from Washington may be urgently needed.

Ethics of Employing Graduates

ABOUT one year ago at the regular Industrial Conference held under the auspices of Pennsylvania State College there was adopted a set or "code" of ethical practices that should prevail in the hiring of graduating engineers. The suggestions promulgated by this group have pointed applications for all the parties affected, and are reproduced here as "To whom it may concern".

"In General:

"1.—Both the educator and the employer should consider as of first importance the interest of the student as a prospective citizen and as a prospective member of the Engineering Profession.

"2.—Every effort should be made to develop that understanding between the engineering schools and industries, which is necessary for intelligent co-operation.

"The Employing Company:

"1.—Should furnish full and not too optimistic information regarding working conditions, opportunities, and rate of advancement.

"2.—Should select only the number of graduates required according to a careful estimate of conditions.

"3.—Should allow the student reasonable time after employment opportunities are presented to become familiar with other opportunities before making a decision.

"4.—Should act promptly on all applications.

"5.—Should secure consent of the student to any contemplated change in the employment agreement.

"6.—Should not employ a student known to have entered into an employment agreement with another, unless consent of the other has been obtained by the student.

"7.—Should avoid prejudicing the student against the opportunities afforded by other companies.

"8.—Should provide opportunities which will enable each graduate to develop his latent possibilities to his own advantage as well as to the advantage of his company and society.

"The Engineering School:

"1.—Should not accept fees for continued instruction of students who obviously will not later qualify for engineering work.

"2.—Should supply unbiased information and advice regarding the various opportunities for employment.

"3.—Should not hamper the student in his freedom of choice in employment.

"4.—Should not refer employment possibilities to the employed graduate, except upon his application, nor attempt to separate the graduate from his employment without first having taken the matter up with his employer.

"The Graduate Engineer:

"1.—Should supply full and correct information regarding his experience and background.

"2.—Should accept only one position at a time.

"3.—Should secure the consent of the employer before changing the employment agreement.

"4.—Should not accept training in a special training course with the intention of using it in the interest of another, without the consent of the employer."

Society Mail

WITH ten copies of Proceedings going to more than 13,000 members each year, also a Year Book, a copy of the pamphlet called Aims and Activities, and a volume of Transactions, one can readily understand that the Society's outgoing mail is heavy.

Nearly 200,000 pieces of this nature were issued in 1928, but as a matter of fact, none of these passed through the Society's office. All containers were addressed there, but the contents were inserted at the binders, and by him shipped to the Post Office in bulk. The mail passing through the office, although miscellaneous in character, is even heavier. It totaled 354,350 pieces, in addition to the above.

Ballots, of course, form one of the larger items. There were 55,067 of these. Bills, original and receipted, totaled 21,992. Meeting programs totaled 61,983; meeting notices in addition to the programs totaled 36,656. For the Technical Divisions 28,014 pieces of mail were issued. Employment Bulletins to the number of 32,000 were sent to the members of the Student Chapters. Separate copies of Proceedings, Transactions, Year Books, Code of Ethics, Membership Certificates, totaled 25,192. Many of these went to new members, but some to members who had been in arrears.

The large item of this miscellaneous group, however, is the daily mail of various kinds and sorts. This totaled 93,446 pieces, or 308 each working day. Counting all its mail issued, the total is the equivalent of 1,825 pieces per day, or if addressed only to members, the equivalent of 46 to each. The total issue in 1928 was 552,862 pieces of mail.

April Proceedings

BESIDES the discussions and memoirs, the April, 1929, Proceedings contains in all, eight papers and reports. A number of interesting tests are described by Ralph L. Parshall, Associate Member, under the title "Experiments to Determine Rate of Evaporation from Saturated Soils and River-Bed Sands". By means of Mariotte tanks he found that the water consumed by the various soils in evaporation could be determined quantitatively. The water-table is kept at different depths below the surface, and other factors are varied accordingly. Conditions of exposure, however, are the same for all samples.

"Problems Concerning Elastic Stability in Structures", by S. Timoshenko, of the University of Michigan, deals with members the resistance of which is governed by their elastic stability rather than their ultimate strength. For example, a large deflection as in a column may be the immediate cause of failure. Other examples are the compressed chord of a half-through span and webs of compressed members and girders. Professor Timoshenko gives mathematical analyses and tables for design.

In describing "The Surveying and Mapping Activities of the Federal Government", T. W. Norcross, Associate Member, gives an excellent bird's-eye view of the many agencies interested in such work; their relations; and the scope of their activities. For any one desiring preliminary knowledge of such Government work, here is a sort of primer that might save considerable effort and the possibility of a wrong approach.

Also on the general topic of mapping, an interesting account entitled "Good Maps Are a Sound Investment", by L. R. Lohr, Member, gives results of an extensive investigation as to the economics of maps and mapping activities. Major Lohr certainly builds up a good case, fortified by numerous well-chosen examples covering various localities throughout the country and all classes of map work.

Next are given four reports in the same general field. These interesting and valuable documents are the results of Committee work within the Division of Surveying and Mapping. In order, they are entitled "Boundary Surveys", by Clarence T. Johnston, Member; "Topographic Surveys", by W. N. Brown, Member; "Location and Construction Surveys", by a Committee headed by W. C. Taylor, Member; and "Control Surveys", by C. V. Hodgson, Member. Any member, especially one versed in the art of surveying, will appreciate that here are given excellent summaries, condensed yet readable, detailing the status of the art at the moment.

Under the heading of discussions are included 40 contributions on 18 current papers. In conclusion, memoirs of 12 deceased members round out the April Proceedings.

Traffic Standards

AMERICAN Engineering Council has published a report on Street Traffic Signs, Signals and Markings, and is now endeavoring to bring about widespread adoption of its recommendations.

The plan is to secure the assistance of local engineering societies, or local groups of engineers, such as the Local Sections of the National Engineering Societies, in the appointment of committees or individuals to bring the report and its constructive suggestions before the public and the authorities.

This seems a matter which practically every Local Section might find well worth doing, from numerous points of view. It is a matter of general interest; one of public well-being; one in the development of which the Local Sections would obtain an enhanced status in the community; and one which, being a nation-wide movement, should result, as a side issue, in a consciousness of solidarity among engineers. It is a cause worthy of a united effort.

Miscellany

Curiously enough, the first member to avail himself of the Society's plan of paid-up dues, the late Richard L. Humphrey, was the first of that group to pass on.

Organization of the Technical Division Executive Committees is now complete. The Chairman and Secretaries selected are: *City Planning Division,* C. E. Grunsky, Chairman, and Harold M. Lewis, Secretary; *Construction Division,* W. J. Barney, Chairman, and A. C. Everham, Secretary; *Highway Division,* H. K. Bishop, Chairman, and C. D. Curtiss, Secretary; *Irrigation Division,* J. B. Lippincott, Chairman, and Fred C. Scobey, Secretary; *Power Division,* L. J. Bevan, Chairman, and P. F. Kruse, Secretary; *Sanitary Engineering Division,* R. Suter, Chairman, and C. G. Wigley, Secretary; *Structural Division,* G. E. Beggs, Chairman, and V. G. Thomassen, Secretary; *Surveying and Mapping Division,* Wm. Bowie, Chairman, and C. V. Hodgson, Secretary; *Waterways Division,* L. C. Sabin, Chairman, and W. H. McAlpine, Secretary.

The Los Angeles Section recently covered in one evening the subject of transportation from Alpha to Omega. Beginning with a lecture on primitive modes of travel as still practiced in many lands, they proceeded to steam and electric lines, bus transportation, freight transfer from ships to motor trucks, and airplane routes.

The subject proved so alluring, the attendance required adjournment from the usual meeting room to larger quarters.

On Saturday, March 9th, the Frank G. Shattuck Company opened in the Society's building on 57th Street, its newest and thirty-third store.

Since last August, contractors have been busy remodelling the structure into as modern a restaurant as can be conceived. The basement is devoted to equipment of all kinds:—a refrigerating plant for the more than half dozen ice boxes, a bakery, a kitchen, electric dumb-waiters, ventilating system, etc., etc., etc.

The first floor contains the usual candy and soda shop, back of which is a large dining room in Gothic style. The second floor contains ten other dining rooms, that devoted to men being called the Florentine Room. The two upper stories contain eight apartments.

Those who knew the building as the Society's home will be interested in its present arrangement. The property is under lease to the Shattuck Company, popularly known as "Schrafft's", for a period of 21 years, the lease providing that the Society shall be relieved of all incidental costs, such as insurance, repairs, assessments, etc., and in receipt of the stipulated net rental.

For its March 9, 1929, meeting, the University of Illinois Student Chapter took as its topic "The Boulder Canyon Dam", with Elwood Mead, Member, as speaker. Also, it "hired a hall"—the University Auditorium. The Chapter claims that the attendance of 1,600 is a record for meetings of Student Chapters.

In harmony with the practice of most large organizations, it has been decided that hereafter receipts will not be forwarded to members who have sent checks in payment of their indebtedness to the Society. This will also have the advantage of lessening the burden on the Bookkeeping Department at Headquarters.

Engineering Standards for Society

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uries which were beyond the reach of kings a generation or two ago. Adding power to the human arm and making it more productive is what characterizes modern industry; the carrying of heavier loads at higher speeds, making the ton-mile faster and cheaper, measures the success of transportation as we know it; and the conquest of distance, making the whole world one neighborhood, is the outstanding triumph of modern communication. All this marvelous progress is simply an exhibit of what engineering by the application of science has wrought in adding cubits to the stature of man.

With civilization running at high speed, there is increased need of devoting the best talent to public welfare. To this end, the great National Engineering Societies may well assume a larger responsibility in keeping America in a condition of preparedness to meet the demands of peace. The burdens of prosperity are already so heavy as to tax to the utmost the genius of engineers.

I have come to look upon the National Engineering Society as a public utility—a chain of interconnected central stations, generating useful currents of thought and distributing this service over large areas. Here is an open forum, a much needed forum, where facts may be presented regardless of what they prove and where opinions may be expressed irrespective of their bearing upon conservative corporation practice or static Government policy.

Even in this enlightened year of 1929 the economies of the steel plant have not penetrated the market place, and the high efficiency of the creators of our electrical equipment is not copied by those who control our city governments. Is not the lesson obvious that engineers are needed in economics and politics? As applied to Government, engineering will mean using fewer officials to do the present amount of work or doing more work with the present force. Many terms in common use by the engineers—such as obsolescence or elimination of waste or even simplification of practice—are unknown to the politician or at best are pronounced by him only with difficulty. Another job for the matter-of-fact engineer in the field of industrial economics is to take some of the psychology out of the business cycle, that resultant of the forces of Nature and of human nature—both of them proper subjects for engineering control.

You engineers know the facts better than the economists, and you are less hampered by reverence for economic theory, much of which is the worse for wear and should soon be replaced by something up to date. Engineers use facts not as pieces on a chess-board to be moved back and forth in a contest of wits, but rather as foundation stones to be assembled where needed and arranged in a fixed and logical order.

Elimination of waste is essentially an engineering problem, whether that waste takes the form of unmarketed crops or of uneducated children, of rust or of graft, of decay in timbers or of rottenness in public officials.

I would, therefore, urge the adoption of the engineering type of specifications even for intangibles. In our thoughtful discussion of the deeper and the higher things of life, how often engineering terms creep into our language—firm foundation, stress and strain, factor of safety. The realities of life call for just such strong words. Might it not be well in our day to take over into our business, social, and even political life not only these engineering terms but more of what lies back of them—the technique, the principles, the mental attitude of the engineer; in short, his engineering standards.

"Machines and the man" would be the opening words of the epic written by a Virgil of this industrial age—and "the man" he would sing is the engineer. It is the engineer who has given to the world of industry a new momentum; he it is who can best chart the trend of the new social order.

One of the many changes of address to be made in the 1929 Year Book, which is now on the press and will reach members early in April, will read:

HOOVER, Herbert. President of the United States, Washington, D. C. (M., Jan. 4, 1910) Hon. M., Dec. 1, 1924.

Committee Personnel

ACTION by the Board at its meeting on January 17 last with respect to two committees is significant.

Since their authorization some years ago the Society's Committee on Student Chapters and the Committee on Registration of Engineers have always been composed entirely of Board members. By the action at the last meeting, these two Committees are now each to be composed of four non-Board members and one Board member who, however, will not be the Chairman, but will act rather as a contact or liaison man.

Board members are required to contribute, not only at Board meetings, but throughout their terms of office, a great deal of time to many different Society affairs, and it is to relieve them of some of this burden that the change is made. Those who favored this change suggested also that from committees composed as proposed there might evolve a more active program than Board members could be expected to undertake.

The significant thing, however, is the implication on the part of the Board that it is desirous of having members take a more active part in Society affairs; that the Board wants members generally to feel their individual responsibility to initiate ideas and to carry them out as agents of the Society. The Committees, as newly constituted, will report to the Board their findings and proposals and, securing the approval of the Board to the same, will put them into effect on behalf of the Board and the Society.

The personnel of the two Committees is as follows:

Student Chapters: H. P. Hammond, New York, *Chairman;* George L. Lucas, New York (Board member); Charles W. Sherman, Bosto George H. Fenkell, Detroit; a O. M. Leland, Minneapolis.

Registration: Allen J. Savil Richmond, Va., *Chairman;* R. Dougherty, New York (Board me ber); T. Keith Legare, Columb S. C.; Charles M. Reppert, Pi burgh; and James H. Herron, Cle land.

The personnel of the Committ will change yearly by the expirat of the term of one member and possible change of the Board me ber.